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Gender effects in peer nominations for aggression and social status

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Little prior research has examined children's interpersonal perceptions of peers from a social relations model framework. This study examines the degree of actor and partner variances, as well as generalised and dyadic reciprocities, in a sample of 351 sixth graders' peer nominations of different forms and functions of aggression and aspects of social status. Gender differences in these nominations are also explored. Results indicate significant actor and partner variances for all measures, and generalised reciprocity in social status perceptions. Clear gender differences were noted in rates of nominations, such that more same-sex than cross-sex nominations were generally given for both positive and negative aspects; however, we found mixed evidence of gender differences in the variance partitioning and reciprocity correlation estimates.

Introduction

Peer nomination instruments are frequently used by peer relations researchers to assess a variety of constructs, including various aspects of aggression and social status. Typical usage involves obtaining nominations from peers, aggregating these nominations to determine what proportion or percentage of youths nominate an individual, then using this value as an index of that individual's behaviour (e.g., aggressiveness) or social status (e.g., social preference). This typical usage considers only one aspect of interpersonal perception, individual differences in tendencies to be nominated for particular items (i.e., partner variance). By examining peer nominations from the perspective of the social relations model (Kenny, 1994; Kenny & La Voie, 1984; Malloy & Kenny, 1986), we hope to demonstrate the additional information that can be obtained from peer nominations. In addition, we will explore the effects of the sexes of nominators and targets on these peer nominations in order to gain a better understanding of the role of gender in youths' interpersonal perception of aggression and social status. Specifically, three aspects of the social relations model (group means, variance proportions, and reciprocity correlations) will be examined among sixth-graders' peer nominations on eight constructs involving aggression and social status: overt aggression, relational aggression, instrumental aggression, reactive aggression, victimisation, peer influence, perceived popularity, and social preference. Before describing specific hypotheses, we will review the roles of each of these aggression and social status constructs in social development and relevant studies using the social relations model with children.

Aggression and social status

Aggressive behaviour has long been distinguished in terms of its forms and functions. In terms of forms, aggression is commonly distinguished into that which is overt (e.g., hitting, pushing, threatening, name calling) and that which is social or relational (e.g., intentionally excluding from group, spreading rumours, withholding friendship; e.g., Cairns, Cairns, Neckerman, Ferguson, & Gariépy, 1989; Crick & Grotpeter, 1995; Lagerspetz, Björkqvist, & Peltonen, 1988; Parke & Slaby, 1983). Overt aggression is more common among boys than girls, whereas relational aggression appears to be more equitably performed by boys and girls (Crick, 1997; Crick & Grotpeter, 1995; Lancelotta & Vaughn, 1989; Salmivalli, Kaukiainen, & Lagerspetz, 2000; Tomada & Schneider, 1997). Further, some researchers have suggested that overt aggression is more socially acceptable among boys than among girls, whereas relational aggression is more socially acceptable among girls than among boys. Evidence suggests that these ''gender normative'' forms of aggression are less strongly related to maladjustment for aggressors than are ''gender nonnormative'' forms (see Crick, 1997; Phillipsen, Deptula, & Cohen, 1999).

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The functions of aggression refer to the motive of the aggressor and have generally been distinguished along the lines of instrumental versus reactive aggression (e.g., Dodge & Coie, 1987). Instrumental aggression (also called proactive or ''cold-blooded'' aggression) refers to that which is deliberate and directed toward obtaining desired goals. Reactive aggression (also called defensive or hot-blooded aggression) refers to that which is an angry, often emotionally dysregulated, response to perceived offences or frustrations. These functions of aggression derive from different theoretical perspectives, which posit that differing social-cognitive processes are responsible for enacting each function of aggression (see Crick & Dodge, 1994, 1996; Dodge & Coie, 1987). Substantial evidence suggests that reactive aggression is more strongly related to several aspects of maladjustment than is instrumental aggression (Little, Brauner, Jones, Nock, & Hawley, 2003; Little, Jones, Henrich, & Hawley, 2003; Prinstein & Cillessen, 2003; Schwartz et al., 1998; Vitaro, Brendgen, & Tremblay, 2002). In fact, emerging evidence exists that some aggression (likely instrumental in nature) is not related to maladjustment and could be related to positive adjustment (see Hawley & Vaughn, 2003).

Social status is now also recognised as a multi-faceted construct. In this study, we consider four aspects of social status: victimisation, peer influence, perceived popularity, and social preference. Victimisation refers to the degree to which children are the victims of their peers' aggression or intentional exclusion from the group. It is conceptually distinct from other measures of social status (e.g., peer rejection) because it describes specific events that happen to the child (rather than attitudes that may be held by peers but not expressed); however, victimisation is highly related to other measures of social status (see Card, 2003; Hodges & Perry, 1999) and can serve as an indicator of children's adaptation with their peers. Peer influence is an aspect of social status that is central to resource control and evolutionary theories (see Hawley, Little, & Pasupathi, 2002), and refers to an individual's ability to affect their peers' behaviour. Perceived popularity refers to children's perceptions that certain individuals are popular within the peer group; a construct that exhibits high but not perfect overlap with social preference (LaFontana & Cillessen, 1999, 2002; Parkhurst & Hopmeyer, 1998). Finally, social preference, which is the most commonly used measure of social status (and, until recently, was often used synonymously with the term social status), refers to tendencies to be highly liked and not disliked by peers (see Bierman, 2004; Newcomb, Bukowski, & Pattee, 1993; Parker & Asher, 1987).

Social relations modelling of children's peer world

The Social Relations Model (SRM) is a conceptual, methodological, and analytic approach that captures the interpersonal nature of perception. This approach has been thoroughly described in previous writings (e.g., Kenny, 1994) and in the other works in this issue, so we will describe it only briefly here, focusing on three aspects of the model that will be examined in the current study: group means, variance partitioning, and reciprocity. First, the SRM provides unbiased estimates of mean levels of perception within groups. It also partitions the variance in interpersonal perceptions into two components. The first variance component is that due to individual differences among perceivers' tendencies to view others in a particular manner (actor variance). The second variance component is that due to individual differences in targets' tendencies to be viewed in certain ways by others (partner variance), and is the component typically examined among peer nomination. If multiple items or multiple time points are available, it is also possible to distinguish unique perceptions into that due to stable relationship effects and that due to random error. Finally, the SRM allows the computation of two indexes of reciprocity. Generalised reciprocity refers to tendencies of individuals who perceive others in a certain way to also be perceived by others as high or low on that characteristic (e.g., if a child views others as aggressive, is this child also viewed as aggressive by others?). Dyadic reciprocity refers to the tendency for one child's view of a peer to be related to that particular peer's view of the child (e.g., if child A views child B as aggressive, does child B also view child A as aggressive?).

Although children spend much of their lives with peers, relatively little is known about the interpersonal perceptions that occur within these contexts from a social relations perspective. Malloy and colleagues (Malloy, Sugarman, Montvilo, & Ben-Zeev, 1995) examined the actor and partner variances among first- through sixth-graders' ratings of random subsamples of peers on cognitive ability, positive affect, attractiveness, popularity, physical strength, and positive behaviour. Their results generally indicated greater partner than actor variance, especially among older children. In artificial play groups of third-grade boys, social relations analyses of aggressive behaviours (Coie et al., 1999) and aggression-encouraging social cognitions (Hubbard, Dodge, Cillessen, Cole, & Schwartz, 2001) revealed generally significant actor and partner variances (more so for instrumental aggression and supporting outcome expectancies than for reactive aggression and supporting hostile attribution biases). However, these findings do not directly speak to perceptions of aggression. In a study of 20- and 30-month-old children's play behaviour, modest actor and partner variances were found for play and conflict behaviours (Ross & Lollis, 1989), though, again, these findings speak to behaviours rather than perceptions. Finally, a few studies have examined children's interpersonal behaviours using designs suggested by the SRM, but did not analyse data in a manner that provided variance partitioning or reciprocity estimates of interest in the current design (e.g., Hawley, 2002; Hawley & Little, 1999).

In summary, we are aware of only one prior study in which social relations analyses of children's interpersonal perceptions (rather than behaviours) were performed (i.e., Malloy et al., 1995). In our view, a more thorough examination of young people's interpersonal perceptions in general, and of perceptions within and across gender in particular, will contribute to our understanding of children's peer relations, specifically of peer reputations for aggression and social status.

Hypotheses of the current study

In predicting patterns of mean rates of nominations among boys and girls, two alternate views can be taken. First, given the existence of intergroup biases (i.e., more favourable views of in-group than of out-group members) among children (Bigler, Jones, & Lobliner, 1997; Egan & Perry, 2001; Martin & Halverson, 1981; Powlishta, 1995), nominations may be distributed such that children nominate same-sex peers more for positive features and cross-sex peers more for negative features. On the other hand, given the gender-segregated

nature of children's peer worlds (see Maccoby, 1998), children may more often observe the behaviours and be more aware of the social status of their same-sex peers relative to their opposite-sex peers. This view would suggest that children are more likely to nominate same-sex peers for both positive and negative qualities.

We are aware of no previous studies examining sex differences in actor and partner variances on interpersonal perception among children. This state of affairs is unfortunate because such work has the potential to elucidate the role of gender in processes of children's interpersonal perception. Studies of adult men and women generally have not focused on sex differences, and those that we reviewed generally reported an absence of sex differences (e.g., Malloy & Albright, 1990, found no differences between groups of male and female college students in actor and partner variances of ratings on several cognitive, emotional, and social characteristics). However, we can still offer several hypotheses based on extensions from prior theory and research.

One interpretation of actor variance is as an index of assimilation, a tendency to see others in a similar way (Boldry & Kashy, 1999; Kenny, 1994). As described above, gender is a salient factor in children's group categorisation. Given well-known tendencies for individuals to see out-group members as more homogeneous than in-groups members (e.g., Linvile, Fischer, & Salovey, 1989; Park & Rothbart, 1982), we hypothesised that actor variance would be greater for cross-sex nominations than for same-sex nominations.

Partner variance can be considered an index of consensus, the extent to which peers agree that particular targets are high or low in a characteristic (Kenny, 1994; Kenny, Albright, Malloy, & Kashy, 1994). It has been suggested that the degree of acquaintance among individuals should be positively related to the degree of consensus (though a review of the literature on ratings of personality traits failed to support this; Kenny et al., 1994). Given the higher amount of interaction among same-sex than among opposite-sex children (Maccoby, 1998), we hypothesised that partner variance would be stronger for same-sex than for cross-sex nominations.

In terms of the two indexes of reciprocity (i.e., generalised and dyadic), there exists no prior research of which we are aware to guide hypothesis generation. An exception is made for liking: A review of the literature on adults (see Kenny, 1994) suggested almost no generalised reciprocity in liking (i.e., that those who like others tend to be liked), but quite substantial evidence of positive dyadic reciprocity in liking (i.e., if person A likes person B, person B tends to like person A). There is also evidence of dyadic reciprocity in children's liking and disliking (see Hartup & Abecassis, 2002). Given the absence of prior literature examining either type of reciprocity in either adults or children for perceptions of other aspects of social status or for aggression, examination of these correlations in the current study will be exploratory.

Method

Participants

Participants were 351 sixth-grade (M age = 10.5 years) boys (n = 178) and girls (n = 173) from 17 classes within 9 elementary schools located in a mid-sized city in northeastern United States. Representative of the population of these schools, participants were 68% Caucasian, 22% African American, 5% Hispanic, and 5% of other or mixed ethnicity. The communities in which these schools were located are generally lower- to upper-middle class.

Procedure and measures

In the fall of the school year, participants were asked to complete a variety of paper-and-pencil questionnaires during three 45-minute testing sessions. Questionnaires were administered by two trained research assistants; one research assistant read the questionnaires aloud while a second assisted participants with any questions. In addition to demographic information about sex, ethnicity, and age, the primary instrument utilised for the current report was a peer nomination inventory.

The peer nomination inventory consisted of 18 items in which participants were asked to nominate which of their grademates fit the description provided in each item. Both same- and cross-sex nominations were allowed, as were cross-class nominations within the same school. These cross-class nominations represented a small percent of total nominations, and were not analysed in the current report (see next section).

Twelve items of the peer nomination inventory were combined to form eight constructs: (1) overt aggression (nominations on ''Who pushes, kicks, or punches others because they've been angered by them?'' plus nominations on ''Who hurts others to get what they want?''; possible values of 0, 1, or 2); (2) relational aggression (''Who keeps people from being in their group of friends if they've been hurt by them?'' plus ''Who ignores or stop talking to others in order to get what they want?''; 0, 1, or 2); (3) instrumental aggression (''Who hurts others to get what they want?'' plus ''Who ignores or stop talking to others in order to get what they want?''; 0, 1, or 2); (4) reactive aggression (''Who pushes, kicks, or punches others because they've been angered by them?'' plus ''Who keeps people from being in their group of friends if they've been hurt by them?''; 0, 1, or 2); (5) victimisation (''Who gets pushed around by others?'' plus ''Who is not played with or hung out with by others?''; 0, 1, or 2); (6) peer influence (''Who gets others to go along with what they say?'' plus ''Who has good ideas or suggestions that the others like to follow?''; 0, 1, 2); (7) perceived popularity (''Who is the most popular?'' minus ''Who is most unpopular?''; –1, 0, or 1); and (8) social preference (''Who do you like to hang out with?'' minus ''Who do you not like to hang out with?''; –1, 0, or 1). It should be noted that the above scores were multiplied by 100 (e.g., instrumental aggression scores could be 0, 100, or 200; social preference could be –100, 0, 100) in order to both facilitate presentation and avoid potential small-number rounding errors, with no effect on analyses of interest in this study.

It should be noted that participants were limited to 10 nominations. Although it might be expected that this would limit the variability in individual differences to nominate more or fewer peers for the items (thus reducing actor variance), only a small percentage of participants nominated the maximum number of peers on any item (ranging from 0.3% to 4.6% for all items used to form constructs, with the exception of ''Who do you like to hang out with?'', for which 15.4% of participants nominated 10 peers). Thus, it was expected that this limitation would minimally attenuate actor variance, with the possible exception of that for social preference.

Data analytic strategy

All data were analysed using the SRM; specifically using *SOREBIG*, a version of the *SOREMO* program modified to accommodate group sizes of up to 45 individuals (compared to 25 individuals accommodated by *SOREMO*; see Kenny, 1998). In order to test hypotheses that variances (actor and partner) and reciprocity correlations (generalised and dyadic) were different from zero, between-group *t*-tests were performed in which estimates of each parameter (weighted by number in group minus 1) were obtained within each of the 17 classes, then we tested whether the dispersion of this parameter estimate across classes (distributed as a *t*-distribution with 16 degrees of freedom) warrants rejection of the null hypothesis (that the parameter equals 0; Kenny, 1994; Kenny & La Voie, 1984; cf. Lashley & Bond, 1997).

In order to test for potential sex effects of the nominator or targets, the overall (irrespective of sex) round-robin design of nominations within the classroom was decomposed into two round-robin designs (for boys' and girls' same-sex nominations) and two half-block designs (for boys' nominations of girls and girls' nominations of boys). This decomposition is represented in Figure 1. After social relations parameter estimates within each design were computed, a series of 2 (sex of nominators) $\times$ 2 (sex of targets) within-class ANOVAs were performed to test for significant sex-of-nominator, sex-of-target, and interaction effects (with variance/covariance estimates from each class weighted by the geometric mean of the number of boys and the number of girls in the class; see Boldry & Kashy, 1999). Significant interactions were further examined through simple effects within genders. It should be noted that nominator and target sex differences can be considered actor and partner effects, respectively. However, to avoid confusion we use the terms nominator and target effects to refer to the fixed effects of sex, and the terms actor and partner to refer to the random effects of individuals within each group (overall class or sex subgroup).

Results

Mean levels of nominations

In order to compare nominations made by boys and girls of other boys and girls, the mean percentages of peers nominated for each of the eight constructs under investigation (overt aggression, relational aggression, instrumental aggression, reactive aggression, victimisation, peer influence, perceived popularity, and social preference) were computed for the four combinations of male and female nominators and targets: boys' nominations of boys, boys' nominations of girls, girls' nominations of boys, and girls' nominations of girls. Tests of nominator sex, target sex, and nominator $\times$ target sex interaction effects were examined through within-group comparisons of these means within the 17 classes studied. Although this is a conservative test in terms of the ability to detect these effects, it was chosen because it parallels hypothesis testing procedures in subsequent sections.

As shown in Table 1, there were no significant nominator, target, or interaction sex effects for nominations of overt aggression. In other words, boys and girls did not reliably differ in their tendencies to nominate others or to be nominated, and the frequency of nominations was not predicted by the interaction of the sexes of nominators and targets. However, nominations for relational aggression did exhibit a significant actor difference: Girls nominated more peers as relationally aggressive than did boys. This effect was moderated by a significant nominator sex by target sex interaction. Follow-up analyses revealed that girls nominated others as relationally aggressive more so than boys when the targets were other girls: paired $t(16) = 3.88$, $p < .001$ when targets were girls and $t(16) = 1.32$, *ns* when targets were boys. Girls were more frequently nominated than boys when nominators were girls, $t(16) = 2.59$, $p < .05$, but boys and girls did not differ in their frequency of being nominated as relationally aggressive by boys, $t(16) = 1.23$, *ns*.

Nominations for instrumental aggression also did not reveal significant nominator, target, or interaction sex effects. Nominations for reactive aggression did not indicate significant nominator or target sex main effects, but a significant nominator by target interaction was evident. Follow-up analyses indicated that boys more often nominated other boys than they nominated girls as reactively aggressive, paired $t(16) = 2.57$, $p < .05$, whereas girls did not differ in their tendencies to nominate boys or girls, $t(16) = 1.05$, *ns*. Girls were less often nominated as reactively aggressive by boys than by girls, $t(16) = 3.77$, $p < .01$, whereas boys did not differ in the nominations received by boys and girls, $t(16) = 0.99$, *ns*.

Girls were found to nominate others as victimised more often than did boys, but this nominator main effect was qualified by a significant sex of nominator by sex of target

Table 1
Mean percentage of peers nominated by sex

	Boys' nominations of		*Girls' nominations of*				
	Boys	*Girls*	*Boys*	*Girls*	*Nominator*	*Target*	*N* $\times$ *T*
Overt agg	6.82	3.17	6.04	4.63	0.12	2.00	1.80
Relational agg	6.00	3.47	4.22	10.07	8.65**	0.92	10.41**
Instrumental agg	5.67	3.81	4.58	6.29	0.66	0.00	2.50
Reactive agg	7.15	2.83	5.68	8.42	2.93	0.16	16.29***
Victimisation	8.96	2.26	8.05	8.01	5.68*	2.84	10.82**
Influence	13.27	4.85	5.38	16.77	4.43	1.12	32.55***
Popularity	3.64	0.66	–3.45	6.10	0.52	2.99	13.56**
Social pref	20.75	0.64	–1.08	20.64	0.17	0.17	84.13***

Nominator, target, and interaction effects of sex based on within-group comparisons across the 17 groups, within-group $F(1, 16)$ for each effect.
*$p < .05$; **$p < .01$; ***$p < .001$.

interaction. Follow-up analyses revealed that girls nominated others more than boys only when potential targets were other girls, paired $t(16) = 3.25$, $p < .01$; girls and boys did not differ in their tendencies to nominate boys as victimised, $t(16) = 0.92$, *ns*. Boys nominated girls as victimised less frequently than they nominated boys, $t(16) = 3.83$, $p < .001$, whereas girls did not differ in their nominations of boys and girls, $t(16) = 0.02$, *ns*.

Peer nominations of influence did not reveal significant nominator or target sex differences (though there was a marginal trend for girls to nominate more peers than did boys, $p = .052$, which is similar to previous research with college students; Lord, Phillips, & Rush, 1980). However, a significant nominator by target interaction emerged in which youths nominated same-sex peers as influential more often than they nominated opposite-sex peers. Specifically, all four paired comparisons were significant: boys more often nominated boys than they nominated girls, paired $t(16) = 3.38$, $p < .01$, girls more often nominated girls than they nominated boys, $t(16) = 5.88$, $p < .001$, boys were more often nominated by boys than by girls, $t(16) = 4.77$, $p < .001$, and girls were more often nominated by girls than by boys $t(16) = 5.26$, $p < .001$.

Nominations of perceived popularity and of social preference followed similar trends in which no nominator or target main effects were evident, but youths viewed same-sex peers more favourably (i.e., more popular and liking more) than cross-sex peers. In terms of perceived popularity, girls viewed other girls as more popular than they viewed boys, paired $t(16) = 3.44$, $p < .01$, whereas boys did not view boys or girls as different in popularity, $t(16) = 1.30$, *ns*; and girls were perceived as more popular by girls than by boys, $t(16) = 3.26$, $p < .01$, whereas boys were perceived as more popular by boys than by girls, $t(16) = 2.99$, $p < .01$. Nominations of social preference differed in all four follow-up comparisons of the nominator by target interaction: boys liked other boys more than they liked girls, $t(16) = 6.93$, $p < .001$, whereas girls liked other girls more than they liked boys, $t(16) = 7.03$, $p < .001$, and boys were more liked by other boys than by girls, $t(16) = 6.16$, $p < .001$, whereas girls were more liked by other girls than by boys, $t(16) = 7.27$, $p < .001$. In summary, nominations of perceived popularity and social preference suggested more positive views of same-sex than of cross-sex peers.

Variance partitioning

As outlined earlier, the variance in nominations of these constructs were first partitioned into actor and partner (and relationship/error) variances without reference to sex by performing a round-robin social relations analysis with each class as a distinct group (see left portion of Figure 1). As shown in the first columns of Tables 2 and 3, statistically reliable actor and partner variances were found for each of the eight constructs investigated.

In order to examine whether the magnitude of these actor and partner variances differed by the sexes of the nominators and targets, these variances were estimated separately for four patterns of nominations: boys nominating boys, boys nominating girls, girls nominating boys, and girls nominating girls. The first and last patterns were analysed as two round-robin designs, while the second and third were analysed as two half-block designs. Tests of differences in actor or partner variances by the sexes of nominators or targets (or the interaction) were examined through within-class comparisons in the 17 classrooms.

As shown in Table 2, actor variances for these constructs were generally reliably different from zero across the four combinations of nominator and target sexes, though actor variances of boys' nominations of boys were less consistent. Only one significant sex difference was evident: Actor variance for popularity was stronger when girls served as nominators (i.e., actors) than when boys served as nominators ($M = .019$ versus .052); $t(16) = 2.39$, $p < .05$.

Partner variances for these constructs were also generally significant across the four combinations of nominator and target sexes (see Table 3). However, the sizes of these partner variances in several instances differed depending on the sexes of the nominators and targets. Partner variances for relational aggression and for popularity were more pronounced when girls served as nominators than when boys served as nominators ($M = .063$ versus .017); $t(16) = 2.19$, $p < .05$.

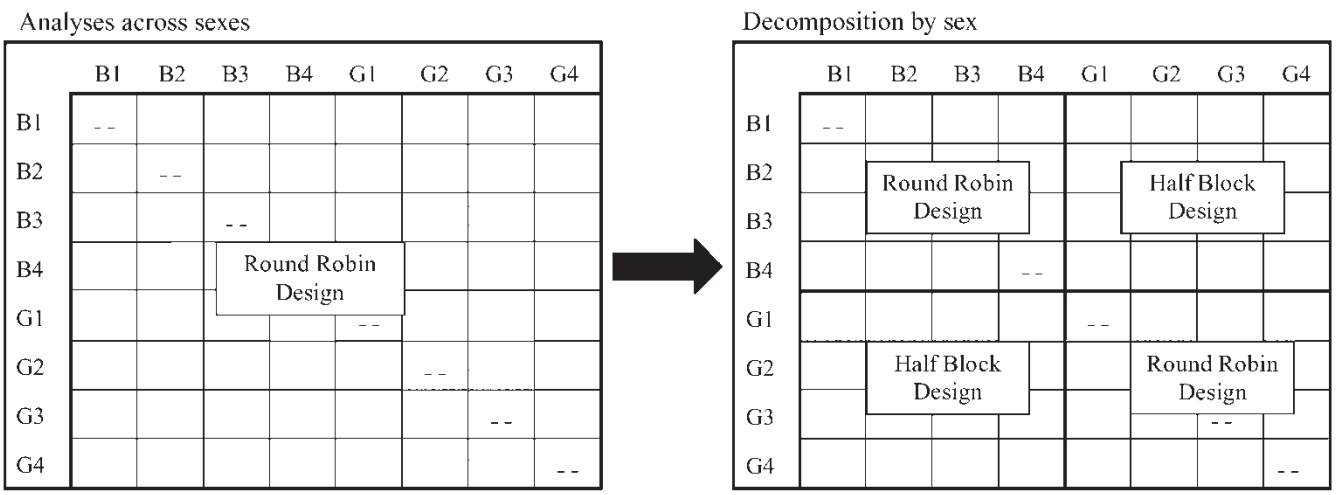
Analyses across sexes
B1 B2 B3 B4 G1 G2 G3 G4
Round Robin Design
Decomposition by sex
B1 B2 B3 B4 G1 G2 G3 G4
Round Robin Design
Half Block Design
Half Block Design
Round Robin Design

Figure 1. Decomposition to examine sex-of-nominator and sex-of-target effects. (B1, B2, etc. represent boy1, boy2, etc. in the class, and G1, G2, etc. represent girl1, girl2, etc. in class.)

Table 2
Relative actor variances of peer nominations by sex

		Boys' nominations of		*Girls' nominations of*				
	Overall	*Boys*	*Girls*	*Boys*	*Girls*	*Nominator*	*Target*	*N × T*
Overt agg	.029**	.020	.025*	.041*	.019**	0.07	1.22	0.72
Relational agg	.024**	.034	.028*	.027*	.044***	0.06	0.07	0.26
Instrumental agg	.033**	.019	.052**	.034*	.026**	0.67	0.28	1.35
Reactive agg	.025***	.033	.045**	.039**	.033**	0.20	0.25	0.42
Victimisation	.031***	.038**	.048**	.034*	.048***	0.01	0.00	0.14
Influence	.023***	.053**	.042*	.038*	.023**	0.50	1.36	0.47
Popularity	.033**	.026**	.011	.035*	.070*	5.72*	0.02	1.88
Social pref	.034***	.037	.072	.037*	.049**	0.06	0.68	0.05

Nominator, target, and interaction effects of sex based on within-group comparisons across the 17 groups, within-group $F(1, 16)$ for each effect. *$p < .05$; **$p < .01$; ***$p < .001$.

The partner variance for perceived popularity also differed depending on the sex of those nominated; partner variance was greater, on average, when boys were being nominated than when girls served as targets. These main effects of nominator and target sex on perceived popularity partner variance were qualified by a nominator by target sex interaction. Follow-up analyses revealed an especially large partner variance for girls' nominations of boys as popular, relative to both girls' nominations of other girls, paired $t(16) = 3.72$, $p < .01$, and boys' nominations of boys, $t(16) = 3.38$, $p < .01$.

Reciprocity of nominations

Tables 4 and 5 provide summaries of findings regarding two indexes of reciprocity, generalised (i.e., between an individual's perceptions of peers in general and peers' perceptions of the individual) and dyadic (i.e., between an individual's perception of a particular peer and that peer's perception of the individual).

Across sexes, those who viewed (i.e., nominated) others as victimised tended to be viewed by others as less victimised ($r = -.21$), those who saw others as influential were viewed by others as influential ($r = .26$), and those who liked others (more positive social preference nominations) tended to be better liked by others ($r = .33$). These and other generalised reciprocity correlations are shown in Table 4. Also shown in this table are sex effects of nominators and targets (and interactions). Although the sexes of the nominator or target did not affect the generalized reciprocity correlations, there was a significant interaction between the sexes of nominator and target for instrumental aggression. Here, the generalised reciprocity correlation in instrumental aggression nominations was more positive for girls' nominations of other girls than for either girls' nominations of boys, paired $t(16) = 2.64$, $p < .05$ or boys' nominations of girls, $t(16) = 2.39$, $p < .05$.

As shown in Table 5, significant positive dyadic reciprocity correlations were found for nominations of liking ($r = .29$), peer influence ($r = .10$), and instrumental aggression ($r = .08$). Because dyadic reciprocities of boys' nominations of girls and girls' nominations of boys were necessarily identical, possible sex differences were explored by performing a three-level (boys, cross-sex, and girls) within-class ANOVA. No significant differences were evident across these three levels for any of the variables under study.

Discussion

Our goal was to examine sixth-grade children's peer nominations of aggression and social status using various aspects of the Social Relations Model (i.e., group means, actor and partner variance, generalised and dyadic reciprocity) in order to better understand the nature of interpersonal perception of these constructs among children. Typical usage of peer nomination instruments has implicitly considered only partner variances; however, our results using the SRM revealed a great deal of

Table 3
Relative partner variances of peer nominations by sex

		Boys' nominations of		*Girls' nominations of*				
	Overall	*Boys*	*Girls*	*Boys*	*Girls*	*Nominator*	*Target*	*N × T*
Overt agg	.097**	.089*	.030*	.057**	.054*	0.57	0.70	2.37
Relational agg	.056***	.024	.009	.047*	.079**	4.79*	0.01	1.18
Instrumental agg	.073**	.040	.036*	.065*	.070**	1.43	0.00	0.24
Reactive agg	.084***	.071*	.030*	.091**	.083**	1.90	0.48	1.10
Victimisation	.166***	.165**	.039**	.137**	.144***	1.19	2.11	4.24
Influence	.062***	.049**	.064*	.017	.092**	0.00	0.96	3.86
Popularity	.150***	.032**	.085**	.177***	.023*	4.94*	6.79*	15.74**
Social pref	.052***	.040*	.042*	.072**	.063**	1.31	0.14	0.01

Nominator, target, and interaction effects of sex based on within-group comparisons across the 17 groups, within-group $F(1, 16)$ for each effect. *$p < .05$; **$p < .01$; ***$p < .001$.

Table 4
Generalised reciprocity correlations of peer nominations by sex

		Boys' nominations of		*Girls' nominations of*				
	Overall	*Boys*	*Girls*	*Boys*	*Girls*	*Nominator*	*Target*	$N \times T$
Overt agg	–.01	.22	–.02	–.09*	.03	0.89	0.00	1.23
Relational agg	.22*	–.07*	–.01	–.04	.21*	1.91	3.78	1.28
Instrumental agg	.14	.06	–.08	–.06	.19*	1.47	3.44	6.56*
Reactive agg	.08	–.02	–.07*	–.06	.29*	1.40	0.81	1.96
Victimisation	–.21*	–.07	–.01	.09	–.11	0.07	0.75	0.20
Influence	.26*	.43**	.01	.22*	.17	0.36	1.95	1.92
Popularity	–.09	.16	.02	–.03	.07	0.83	0.00	2.95
Social pref	.33***	.15	.13	.07	–.02	0.64	0.18	0.84

Nominator, target, and interaction effects of sex based on within-group comparisons across the 17 groups, within-group $F(1, 16)$ for each effect.
* $p < .05$; ** $p < .01$; *** $p < .001$.

complexity in the qualities of interpersonal perceptions inherent in peer nomination data. Moreover, differences in these variances emerged depending on the sexes of both nominators and targets. The results of our study provide some unique insights to the gender-segregated nature of interpersonal perceptions.

Peer nominations of the various dimensions of aggression (overt, relational, instrumental, and reactive) were characterised by reliable actor and partner variances, indicating that children tend to differ in the degree to which they perceive others as enacting these aspects of aggression, and that there is consensus within the peer group about who enacts these aggressive behaviours. We found evidence of generalised reciprocity in nominations of relational aggression (but not overt aggression), and evidence of dyadic reciprocity in instrumental aggression. Although there exist several potential explanations for reciprocity in interpersonal perception (see Kenny, 1994), we believe that the positive reciprocity of relational aggression is due to individuals using this form of aggression eliciting these aggressive behaviours from their peers, which in turn influences the individuals' perceptions of their peers' relational aggressiveness. In other words, children who are relationally aggressive might elicit relational aggression from their peers (in general and from specific peers), which in turn causes these children to have the perception that their peers (in general and specific peers) are relationally aggressive. Similar processes with individual peers might explain the dyadic reciprocity of instrumental aggression indicated by our results. These explanations assume that peers' nominations (i.e., partner effects) accurately reflect the child's behaviour; thus, it is unclear why similar findings were not evident for overt forms of aggression, which are readily observable by peers. Perhaps this lack of reciprocity may be due to more clearly defined power differentials between overt aggressors and their victims, resulting in little retaliation. This explanation may be examined further within longitudinal studies, as it might suggest that reciprocal perceptions in aggression will increase with familiarity (e.g., as the school year progresses).

We did not find gender differences in the rates of nominations for overt or instrumental aggression; however, same-sex nominations for relational and reactive aggression were more common than cross-sex nominations. Relational and reactive aggression may be relatively more visible to (and hence, more often nominated by) same-sex than cross-sex peers because these types of aggression may occur more often than other types (overt and instrumental aggression) within

Table 5
Dyadic reciprocity correlations of peer nominations by sex

	Overall	*Boys' nominations of boys*	*Cross-sex nominations*[a]	*Girls' nominations of girls*[b]	$F(2,32)$
Overt agg	.01	.03	–.01	.04	1.25
Relational agg	.06	.04	.01	.06	0.16
Instrumental agg	.08*	.02	.00	.09*	1.35
Reactive agg	.00	–.02	–.01	.02	0.18
Victimisation	–.01	–.02	–.01	–.01	0.36
Influence	.10**	.02	.01	.15**	3.12
Popularity	.01	–.03	.01	.00	1.18
Social pref	.29***	–.01	.07*	.10*	2.98

Nominator, target, and interaction effects of sex based on within-group comparisons across the 17 groups, within-group $F(1, 16)$ for each effect.
[a] Dyadic reciprocities of boys' nominations of girls and girls' nominations of boys were necessarily equivalent.
[b] In one class with only three girls it was not possible to estimate a dyadic reciprocity correlation. Dyadic reciprocity values of zero were substituted for girls' nominations of girls in this class, with no impact on the results.
*$p < .05$; **$p < .01$; ***$p < .001$.

same-sex friendships and cliques (see Card, Rosenfeld, Isaacs, Beasley, & Hodges, 2001; Grotpeter & Crick, 1996). The failure to find a sex of target effect for overt aggression is surprising given consistent findings that boys are more overtly aggressive than girls, including when assessed by peer nominations (e.g., Crick, 1997; Crick & Grotpeter, 1995; Lancelotta & Vaughn, 1989; Salmivalli et al., 2000; Tomada & Schneider, 1997). Although we initially suspected that this failure to detect such a difference could be due to the conservative method of detecting these mean-level sex differences (i.e., within class comparisons), post hoc analyses performed at the level of the individual rather than the class indicated only a nonsignificant trend of boys receiving more nominations for overt aggression than girls, $t(349) = 1.69$, $p = .092$.

Sex differences in nominations for relational aggression indicate a gender-segregated pattern. Namely, the previous research showing that girls have higher levels of peer-nominated relational aggression than boys appears to be accurate only among same-sex peer nominations (e.g., Crick & Grotpeter, 1995; Lancelotta & Vaughn, 1989). Our findings did not reveal sex differences in the magnitudes of actor or partner variances in nominations of overt, reactive, or instrumental aggression. However, we did find that consensus (i.e., partner variance) in relational aggression was greater when girls were nominators than when boys were nominators, suggesting that girls may be more aware, and in greater agreement, of who is relationally aggressive. Generalised reciprocity of perceptions of instrumental aggression also differed by sex. Here, only girls' nominations of other girls were marked by positive reciprocity. Thus, the previously noted failure to detect generalised reciprocity in instrumental aggression was apparently due to sex differences in which this reciprocity is evident among girls but not boys; instrumentally aggressive girls may elicit similar behaviour from their peers, thus resulting in their view that others are aggressive. That this occurred among girls but not boys may be due to the different forms typical of each: relational aggression (for which there is reciprocity) among girls and overt aggression (for which there is no evidence of reciprocity) among boys. Sex differences in the degree of dyadic reciprocity of perceptions of aggressiveness were not indicated.

We found significant actor and partner variances for all four measures of social status (victimisation, peer influence, perceived popularity, and social preference). The actor and partner variances indicate that young people tend to both differentially perceive and show consensus in their perceptions of social status. Positive generalised reciprocities were also found for peer nominations of social preference and peer influence: Young people who tend to like their peers (i.e., give positive social preference nominations) tend to also be liked by their peers, and young people who view others as influential are viewed as influential by others. In contrast, we found negative generalised reciprocity for victimisation: Young people who view others as victimised tend to be not viewed as victimised by others, whereas young people who do not view others as victimised tend to be perceived as victimised by their peers. This pattern suggests the existence of social comparison processes for victimisation: Young people who are highly victimised may tend to not notice or perceive others' treatment by peers as victimisation. In terms of dyadic reciprocity, positive reciprocity was indicated for perceptions of peer influence and social preference: Young people who view a particular peer as high in these aspects of status also tend to be viewed as high in these characteristics by these particular peers. For example, if Child A likes Child B, Child B tends to like Child A; whereas if Child A dislikes Child B, Child B also tends to dislike Child A. This pattern is likely to be due to frequent expressions of one's feelings within relationships based on mutual liking or disliking (i.e., friendships and antipathetic relationships; see Card, Giordano, Rakamaric, Santana, Mancuso, & Hodges, 2002). Similarly, we found reciprocal perceptions for peer influence, suggesting that certain dyads within the peer group may mutually influence one another (e.g., mutually influential friendships; see Berndt, 1982; Kandel, 1978; Poulin, Dishion, & Haas, 1999), or otherwise be aware of one another's ability to influence peers.

Perceptions of social status also differed by gender. For all four measures of social status, same-sex nominations were more frequent than cross-sex nominations: Young people tend to view their same-sex peers as more victimised, more influential, and more popular than cross-sex peers, and they also tend to prefer same-sex over cross-sex peers. In-group bias in liking has been demonstrated in numerous previous studies (see Maccoby, 1998), and these findings suggest that this bias extends to perceived popularity. Our finding of greater same-sex than cross-sex nominations on influence is consistent with Maccoby's (1990, 1998) conclusion that influence more often occurs within sex than between the sexes. Maccoby also suggested that boys would be especially unresponsive to much of girls' influence; however, our post hoc comparisons did not reveal a difference in the rates of boys' and girls' cross-sex nominations of influence.

Regarding sex differences for actor and partner variances on social status nominations, only one actor variance estimate was significantly different: Actor variance for perceived popularity was more pronounced when girls served as nominators than when boys were nominators. In other words, differences in viewing others as popular or unpopular were more pronounced among girls than boys. Partner variance for perceived popularity was also related to the sex of nominators, although this was qualified by an interaction with target sex: Partner variance of perceived popularity was largest among girls' nominations of boys. In other words, we found high consensus among girls as to which boys were popular and unpopular. This may indicate that qualities that differentiate boys' popularity among girls at this age are especially observable (e.g., physical dominance; see Pellegrini & Long, 2003). Sex differences in generalised or dyadic reciprocity of nominations were not indicated for any of the social status variables.

Taken together, these results indicate higher rates of same-sex than of cross-sex nominations on both positive (e.g., social preference) and negative (e.g., victimisation) aspects of social status, whereas only relational and reactive aggression showed this pattern. Perhaps these aspects of aggression are more embedded within the gender-segregated social milieu, whereas overt forms and instrumental functions (e.g., bullying) of aggression are more readily viewable to cross-sex peers. That the sex differences found among six of the eight variables exhibited the same pattern of greater same-sex than cross-sex nominations is consistent with our hypothesis that the gender-segregated nature of children's social worlds (e.g., Maccoby, 1998) would result in more same-sex than cross-sex nominations for both desirable and undesirable characteristics. These findings run counter to the alternate hypothesis based on intergroup biases that suggested that same-sex nominations

would be greater than cross-sex nominations only for positive features, but that cross-sex nominations would be greater than same-sex nominations on negative features. Thus, traditional paradigms based on in-group/out-group biases seem to be inadequate to explain the gender-segregated worlds of children at this age.

Sex differences in actor variances were generally not evident. In addition to individual differences in the tendency to view others in a particular manner, actor variance reflects assimilation, or tendencies for individuals to have homogeneous perceptions of others (Boldry & Kashy, 1999; Kenny, 1994). The absence of sex differences thus suggests that young people do not adopt a more assimilative, or stereotyped, view of their cross-sex than same-sex peers, as would be suggested by the well-established principle of out-group homogenisation (e.g., Linville et al., 1989; Park & Rothbart, 1982). Together, the higher rate of same-sex than cross-sex nominations across positive and negative characteristics and the general failure to find sex differences in actor variances suggest that young people's interpersonal perceptions are not well explained by classic in-group / out-group processes of bias and homogenisation. Instead, children's interpersonal perceptions tend to be marked by greater saliency of same-sex peers' than cross-sex peers' characteristics (i.e., aggressiveness and social status), but similar processes (i.e., degrees of assimilation and consensus) explain these perceptions. It is worth noting that evidence for such an outcome could not be found using traditional partner-effects-only approaches to peer nominations. That young people are prone to sex-segregated perceptions even in the context of sex-diverse school environments suggests lines of future research on the effects of salient demographic factors (e.g., ethnicity, socioeconomic status) and peer group aspects (e.g., cliques, social status groups) on children's interpersonal perception.

In addition to illuminating the effects of sex on children's interpersonal perception, these findings have implications for the use of peer nomination instruments to assess aggression and social status. That there were reliable partner variances across the measures of aggression and social status supports the traditional usage of peer nomination inventories to assess individual differences in tendencies to be nominated on these constructs by peers. There is a degree of consensus (see Kenny, 1994; Kenny et al., 1994) within peer groups about which young people are aggressive (overtly, relationally, instrumentally, and reactively) and about social status (who is victimised, influential, popular, and preferred). That is, meaningful individual differences in children's tendencies to be nominated by their peers can be obtained by aggregating the number of nominations they receive. The existence of reliable actor variances, however, indicates that additional information can be gleaned from peer nominations; namely, young people's tendencies to perceive others as aggressive and as having high or low social status. Further examination of actor effects may be a potentially fruitful avenue for future research. For example, tendencies to view peers as aggressive may be a product of biased social information processing (i.e., hostile attributional biases; see Crick & Dodge, 1994; Dodge & Coie, 1987). Thus, an important adjunct to the partner effects of peer nomination data is the rich information that can be obtained through consideration of the interpersonal nature of peer nominations.

Several limitations of this study warrant mention. First, this study used single variables assessed at one time point to represent each construct. Therefore, it was not possible to differentiate stable relationship variance from unstable error. Relationship effects offer a potentially important additional source of variance in children's peer nominations. Previous research has shown that relationship effects are an important explanatory factor of actual aggressive behaviour (Coie et al., 1999) and supporting social cognitions (Hubbard et al., 2001); they are also likely to account for interpersonal perceptions of aggressiveness, as well as social status. This study was also limited in terms of age. Malloy and colleagues (1995) demonstrated that the magnitudes of actor and partner variances in children's peer perceptions vary with age. Whether the actor and partner variances, as well as the indexes of reciprocity and sex differences, differ with age represents an important question for future research. It might be especially interesting to explore these sex differences in mid- to late-adolescence when the amount of cross-sex interaction increases (see Rubin, Bukowski, & Parker, 1998). Finally, this study examined children's interpersonal perceptions in the fall of the school year, when children have had only a couple of months of interaction. Although most of these sixth-graders had probably known one another for several school years—indeed, the evidence of consensus across all constructs studied suggests familiarity—it will be important to explore these effects later in the school year after the classes have had longer periods of interaction.

Despite these limitations, this study adds to the extant literature by elucidating the impact of children's gender-segregated social worlds on interpersonal perceptions of aggression and social status. Moreover, this study demonstrates how additional information can be gained from peer nomination instruments beyond individual differences in number of nominations received, namely individual differences in tendencies to perceive others as high or low social status or as aggressive (i.e., actor variances). Further examination of these individual differences and their correlates requires going beyond typical usage of peer nomination inventories and adapting sophisticated techniques of conceptualising and analysing the dyadic nature of interpersonal perception, such as that offered by the Social Relations Model.

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